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Occupational Segregation by Gender: A Look at the Future

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OCCUPATIONAL SEGREGATION BY GENDER: A LOOK AT THE FUTURE

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I. INTRODUCTION

Occupational segregation, on the basis of gender, has occurred in the work place for years, with some occupations (e.g. nursing and elementary education) dominated by women while others are dominated by men (e.g. engineering and managerial positions). The adverse effects of this type of segregation are relevant to any woman in the work force and have been widely discussed in the literature (see, for example, Bergmann, 1986; Stevenson, 1975). For example, women in female-dominated occupations earn significantly less than men in male-dominated occupations who have similar human capital endowments. Also, career advancement opportunities are more limited for women who find employment in traditional female-dominated occupations.

Another adverse result of occupational segregation is that the occupations that women typically enter have undesirable characteristics. For instance, there is considerable evidence that women's work, such as secretarial and clerical duties, is more stressful than other "male" occupations. Out of 130 occupations studied by the National Institute of Occupational Safety and Health (NIOSH) in 1986, secretaries had the highest level of stress-related diseases. Data entry clerks, who are mostly women, have the highest stress levels according to the NIOSH, due to the full-time use of the video display terminals. (Curran and Renzetti, 1989, p.183). Many of these jobs are very monotonous and they allow

little creativity. They include little tasks that must be completed within a certain amount of time so this creates pressure. Furthermore, opportunities for advancement, mobility, prestige, or higher wages are few in these types of jobs. Work place segregation keeps women, not men, locked into such jobs.

The principle purpose of this paper is to determine the prospects of reducing occupational segregation between now and 2005. This will be accomplished by exploring the barriers to occupational integration and the rate at which non-traditional job opportunities for women will become available in the future.

The continuation of occupational segregation depends upon two things: whether or not these barriers are present and to what extent, and also upon the speed with which new jobs open up in traditionally male occupations and female occupations. If opportunities in male-dominated fields expand rapidly and/or jobs in female-dominated fields expand slowly, the prospects for more rapid integration are favorable. This assumes that women will move into these new jobs (because there are now more jobs available) and in doing so, will decrease segregation among occupations.

After presenting evidence regarding the extent of segregation (Section 2), a theoretical model called the "crowding model," which explains the economics of occupational segregation is presented (Section 3). In section 4, an extensive review of the literature is conducted to uncover barriers to occupational integration. Section 5 provides the development of an empirical model to measure the growth of different male-dominated and female-dominated

occupations. A summary and evaluation of the growth rates of these occupations is contained in Section 6. Finally, conclusions are drawn and policy proposals are suggested in Sections 7 and 8.

II. EVIDENCE OF SEGREGATION

According to data from the Bureau of Labor Statistics, in 1990 only 19.3 percent of all physicians were women, 18.4 percent of all architects were women, and a minuscule 5.0 percent of all civil engineers were women. The situation is no better for males. Of all elementary school teachers, 14.8 percent are men, 11 percent of all telephone operators are men, and 5 percent of all dieticians are men. (see Appendix for statistics on all occupations).

The extent of segregation in recent years can be seen in Figures 1-4. These graphs illustrate the extent of occupational segregation in several important occupations from 1980 through 1990. Figure 1 illustrates, for example, that well over 98 percent of all secretaries are women and that this percentage has stayed consistent over the decade. By comparison, well under 15 percent of all protective service workers are women, although there have been some gains over the decade.

Figure 2 tells a similar story. About 95 percent of all registered nurses are women, a figure which has declined only slightly during the 1980s. On the other hand, less than 8 percent

FIGURE 1

SERVICE-PROTECTIVE vs. SECRETARIES
% FEMALES IN EACH

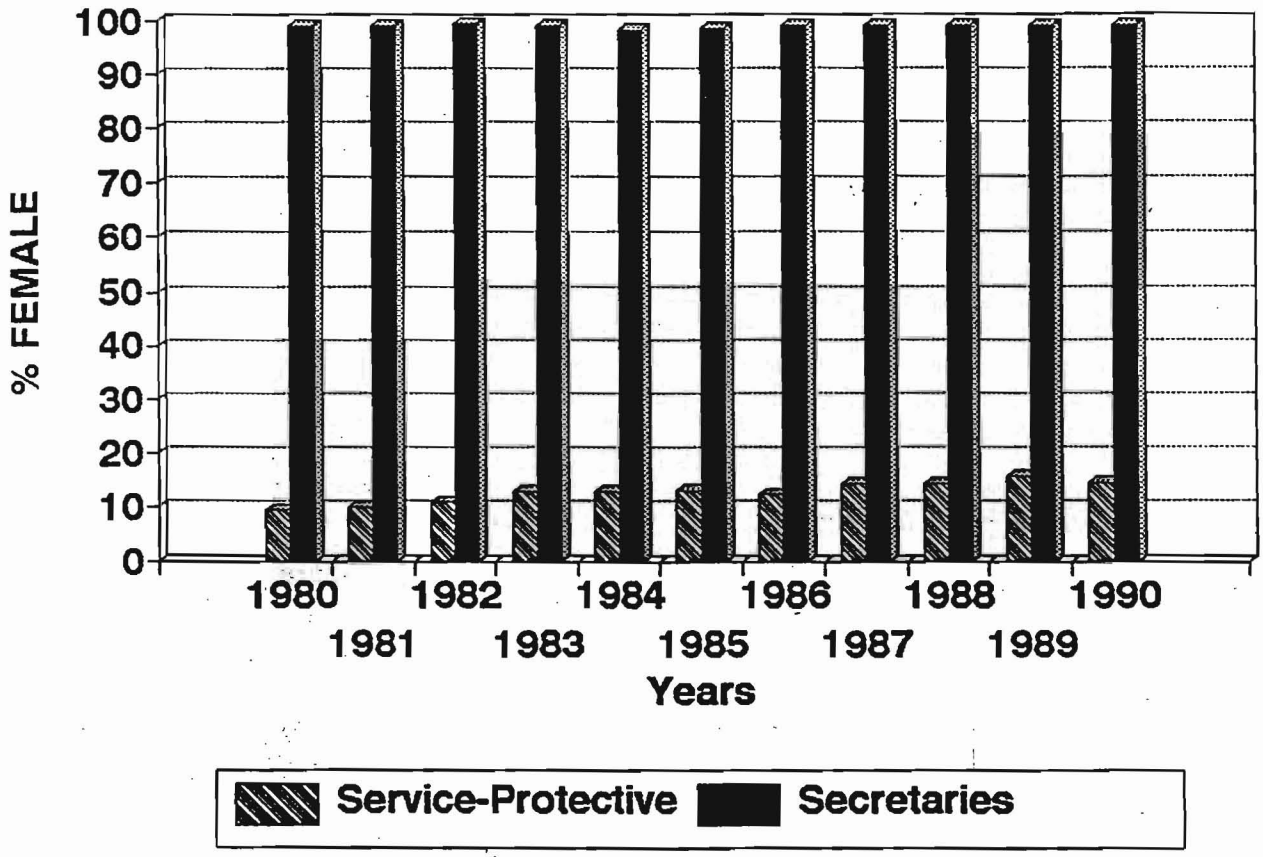
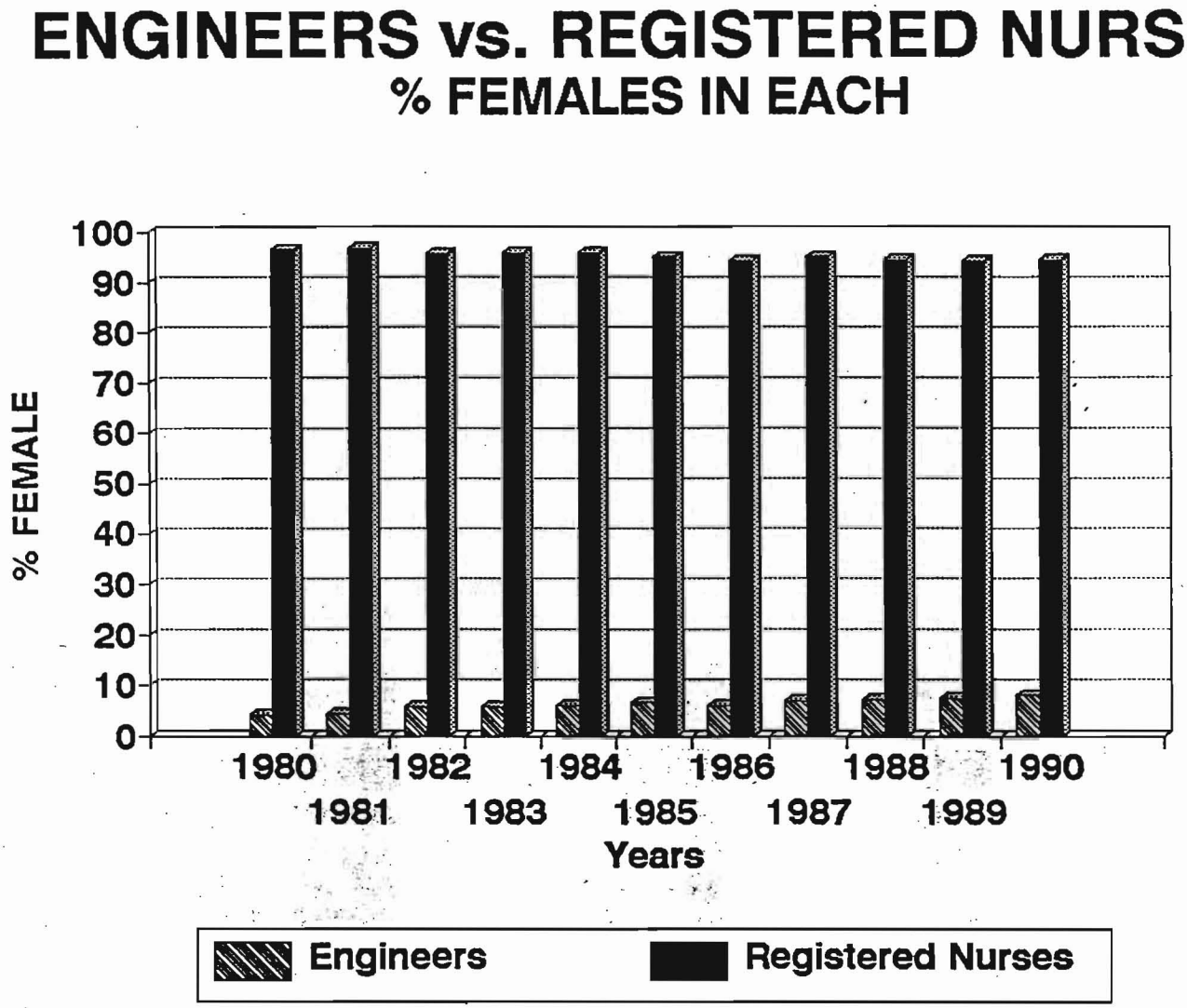


FIGURE 2


ENGINEERS vs. REGISTERED NURSES
% FEMALES IN EACH
% FEMALE
100
90
80
70
60
50
40
30
20
10
0
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
Years
Engineers
Registered Nurses

of engineers were women in 1990. Again, although women remain underrepresented in this occupation, they increased their representation considerably during the 1980s.

In Figure 3, a comparison of college and elementary school teachers shows similar patterns. An examination of all thses trends suggests that female-dominated occupations are staying female-dominated while male-dominated occupations are slowly yielding to integration. Figure 4 shows, for example, that women are also making inroads into legal and managerial occupations.

Today's generations are witnessing a departure from the old system of sex roles in which the man was the sole supplier of income in the family and the woman was restricted to the house and taking care of the children. In fact, the participation of women in the work force has grown over time. In 1990, women represented 45 percent of the work force. (Kutscher, Ronald E., p.9) These changes can be explained by changes in attitudes toward women, an increase in single parent families, and changes in gender roles.

The increasing commitment of women to continuous labor force participation and the continued tendency for women to enter female-dominated jobs has important implications for labor markets. One is that women are compensated less than men. This implication, and others, are explained within the framework of an economic model below.

FIGURE 3

COLLEGE vs. ELEMENTARY TEACHERS
% FEMALES IN EACH

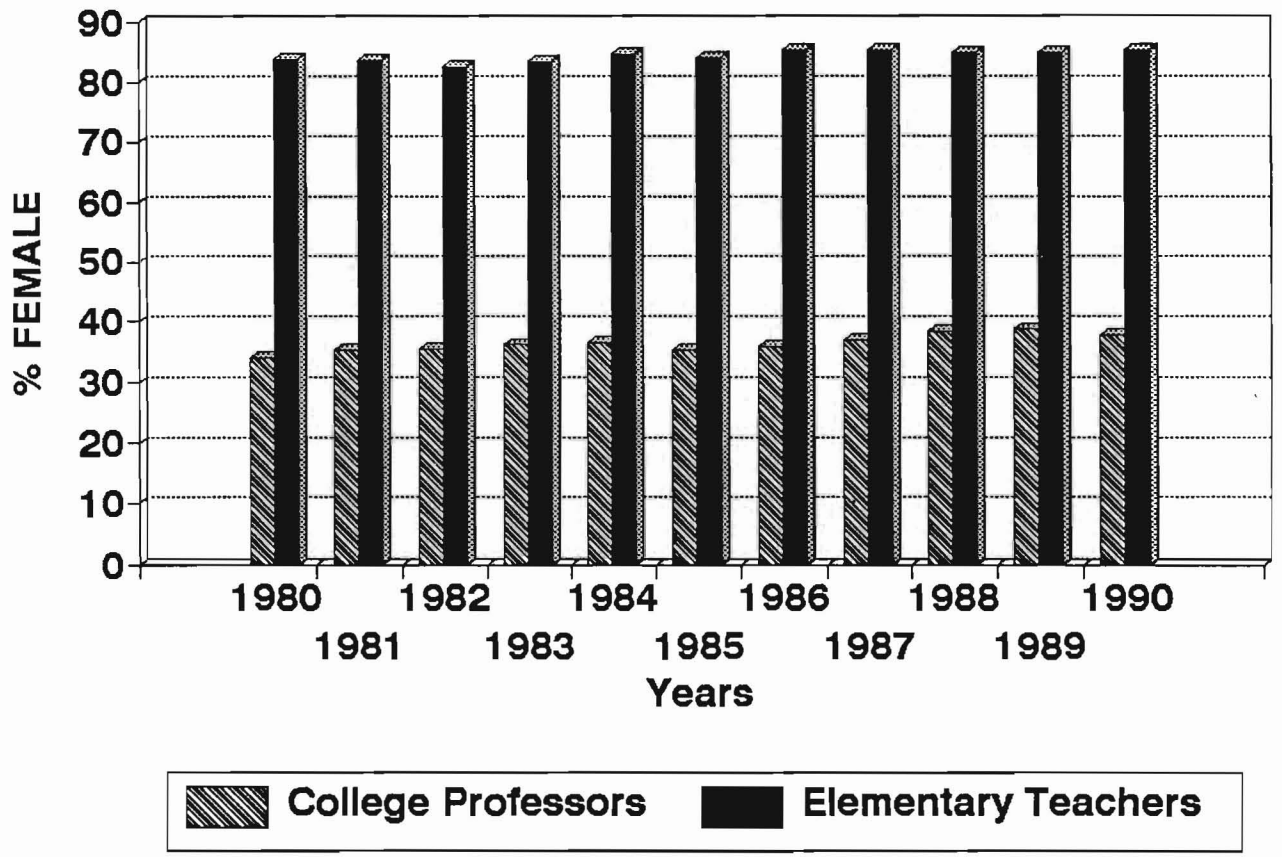
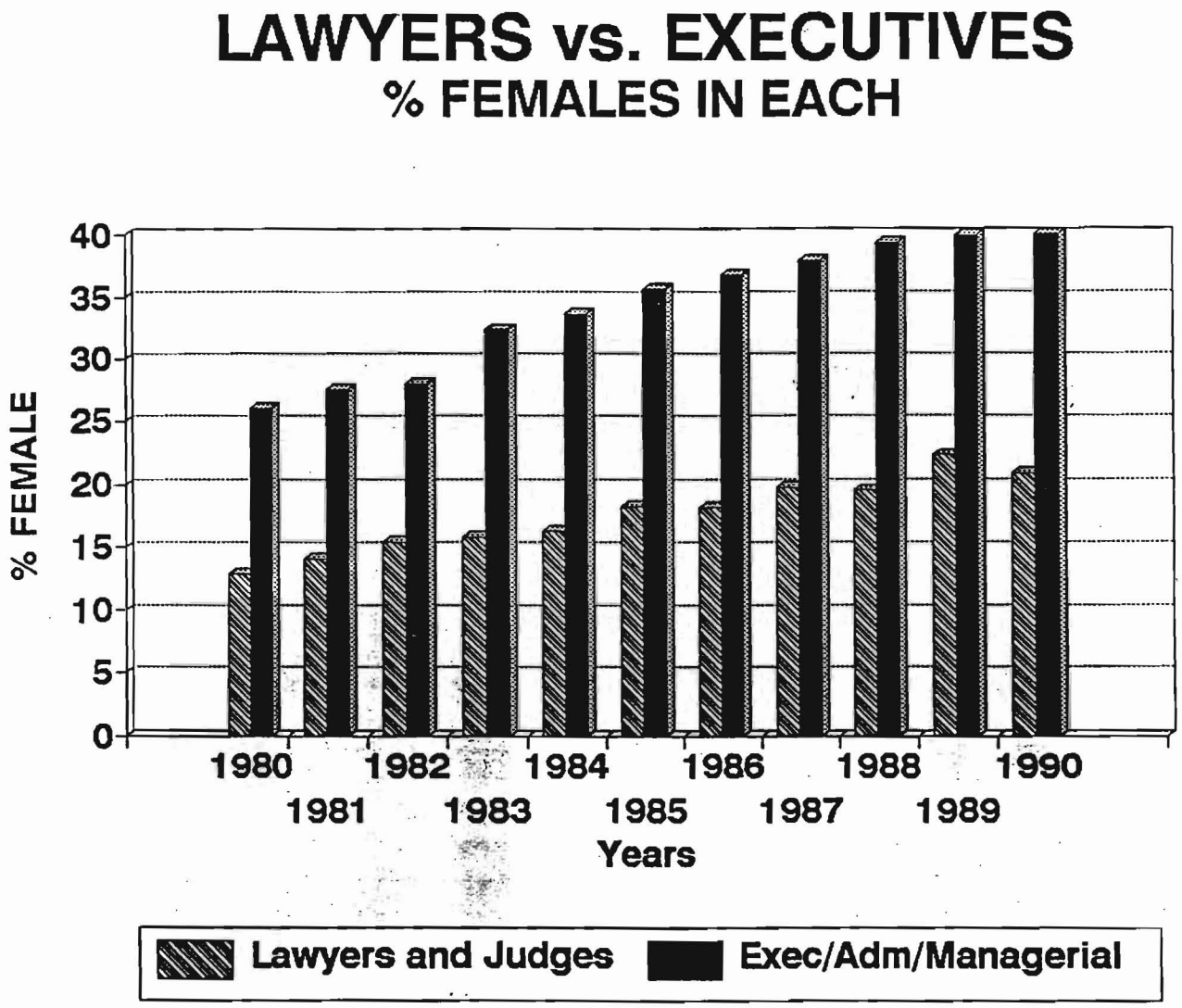


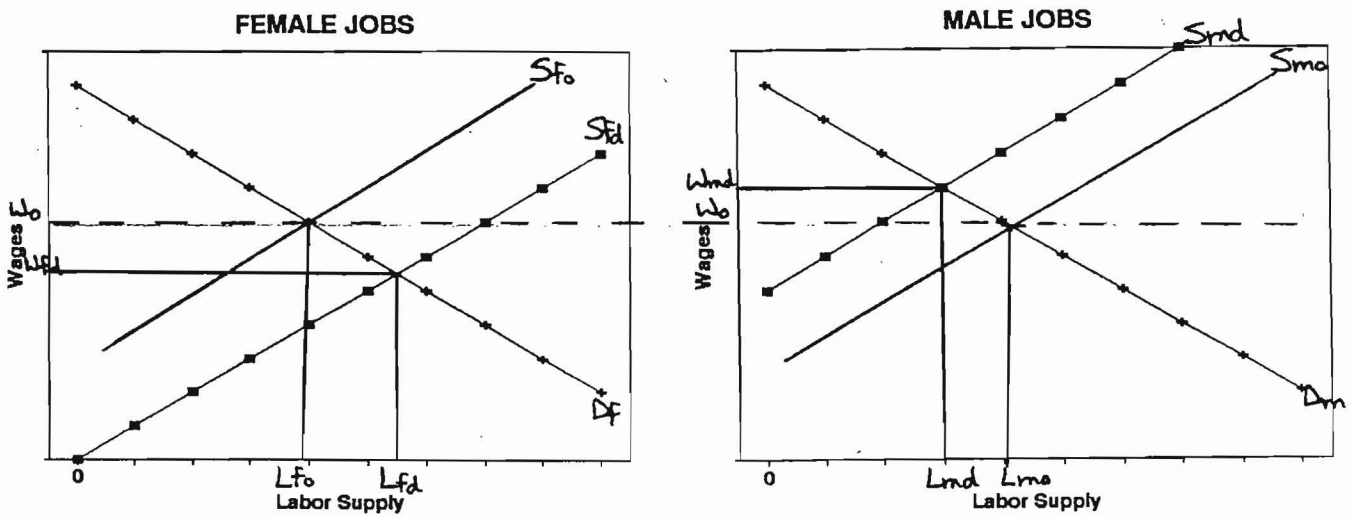
FIGURE 4


LAWYERS vs. EXECUTIVES
% FEMALES IN EACH
% FEMALE
40
35
30
25
20
15
10
5
0
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
Years
Lawyers and Judges
Exec/Adm/Managerial

III. THEORETICAL FRAMEWORK (THE CROWDING MODEL)

The most important theory concerning occupational segregation is the "crowding theory" developed by Barbara Bergmann, which emphasizes the distributive effects of occupational segregation. This theory states that because women are denied access into certain occupations due to certain barriers to entry, they are crowded into a limited number of remaining occupations. This crowding leads to lower wages for women.

A model can be used to illustrate how this sex segregation in employment may cause a wage differential between otherwise equally productive male and female workers. This model is as follows:



One graph represents male jobs and the other represents female jobs. Initially, it is assumed that male and female workers are perfect substitutes for each other. (In other words they are equally productive). D_f and D_m represent the demand curves for females and males, and S_{fo} and S_{mo} represent the supply curves, assuming there is no discrimination. According to the graph, the wage earned by the male and female worker is the same. Suppose that the wage in female jobs is set higher than that in the male jobs. Then, workers attracted by the higher wage rates would transfer from male to female jobs. This would continue until wages in the female jobs would be pushed down to the level of wages in male jobs. Similarly, if wages in male jobs were set above those in female jobs, workers would move to the male jobs until the differential was eliminated. This shows that in the absence of discrimination, the fact that workers can change jobs ensures that the wages paid for both types of work will be the same, after adjustments are made of course.

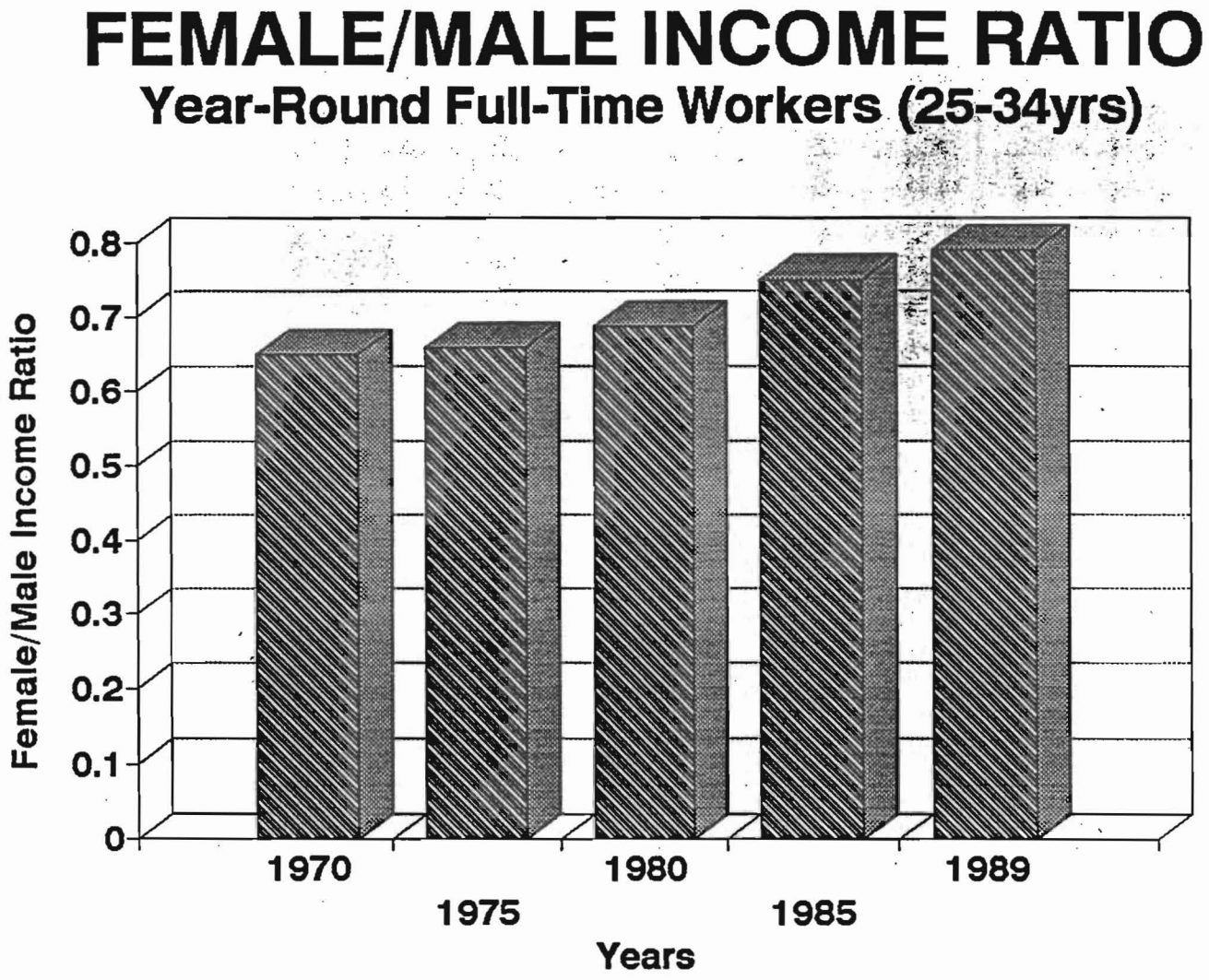
The situation changes when there is discrimination. Suppose there is discrimination which causes women to choose to concentrate in typically female jobs. The consequences of such segregation can be compared to the situation in which there was no discrimination and no segregation. In the case of discrimination, women are restricted from entering the male jobs. This leads to a shift in the supply curve of male jobs from S_{mo} to S_{md}, causing wages to be bid up to W_{md}. At this higher wage only L_{md} workers are employed in male jobs. Because women are restricted from entering the male

jobs, they must all "crowd" into the female jobs. This causes the supply of labor into the female jobs to increase from S_{fo} to S_{fd}. After this increase in the supply of women workers, wages are bid down to W_{fd}. Also, the number of workers increases from L_{fo} to L_{fd}. (Blau and Ferber, p.256-57)

This overcrowding model describes how sex segregation may cause a wage differential between otherwise equally productive male and female workers. If the supply of women entering the labor market is large relative to the demand for labor in the female jobs, and discrimination eliminates free mobility into the male dominated jobs, then a wage differential will occur.

According to 1990 data from the Bureau of Labor Statistics, the female/male wage differential has decreased over time, yet there is still a wage differential. (Bureau of Labor Statistics, 1990) This wage differential suggests that there is still overcrowding in the market. Data were taken from a table which included the median incomes of year-round full-time workers ages 25-34 years old. (see Figure 5) The median income of female full-time workers was divided by the median income of male full-time workers to determine income ratios. In 1970, the income of those women who were year-round full-time workers, was 64 percent that of men; in 1989, the income differential of women to men was 79 percent. (Bureau of Labor Statistics, 1990) In order to raise female earnings relative to men's earnings, the causes of discrimination and barriers to female entry into male dominated jobs must be identified and removed.

FIGURE 5


FEMALE/MALE INCOME RATIO
Year-Round Full-Time Workers (25-34yrs)
Female/Male Income Ratio
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1970
1975
1980
1985
1989
Years

IV. CAUSES OF OCCUPATIONAL SEGREGATION

Some of the barriers that explain the crowding that is described in the above model are described in this section. Some are historical and sociological in nature and some are based in economics. The following explanations of occupational segregation are assessed below: 1) social spheres theory, 2) human capital explanation, 3) statistical discrimination, and 4) overt discrimination.

Separate Spheres Ideology

The separate spheres ideology is an historical explanation of the roles a woman and man should play in society. Before capitalism, the family worked as a unit to produce what they needed to survive, trading with other families for what they could not produce. The rise of the factory system in the nineteenth century brought the separation and development of economic and family relationships, constructing separate spheres of social life. (Matthaei, p.101; Curran and Renzetti, p. 145) These separate spheres placed the man as the financial provider of the family. "Under capitalism, men's striving in the economy became, literally, a seeking of their selves, a struggle to establish their own identities by economically competing with other men." (Matthaei,

p.105) The woman was to be the keeper of the house and children, not only to rear the children but to make the home comfortable for her husband. Compared to man's social role of earning wealth and being a citizen, woman's work of homemaking has appeared as crude and natural. Implicit to the theory is that woman is not man's social equal, but rather an inferior unqualified for work life outside the home. (Matthaei, p. 110). Those women who did choose to work, were usually slotted into low paying jobs, which kept them dependent on men and marriage. (Curran and Renzetti, p.145)

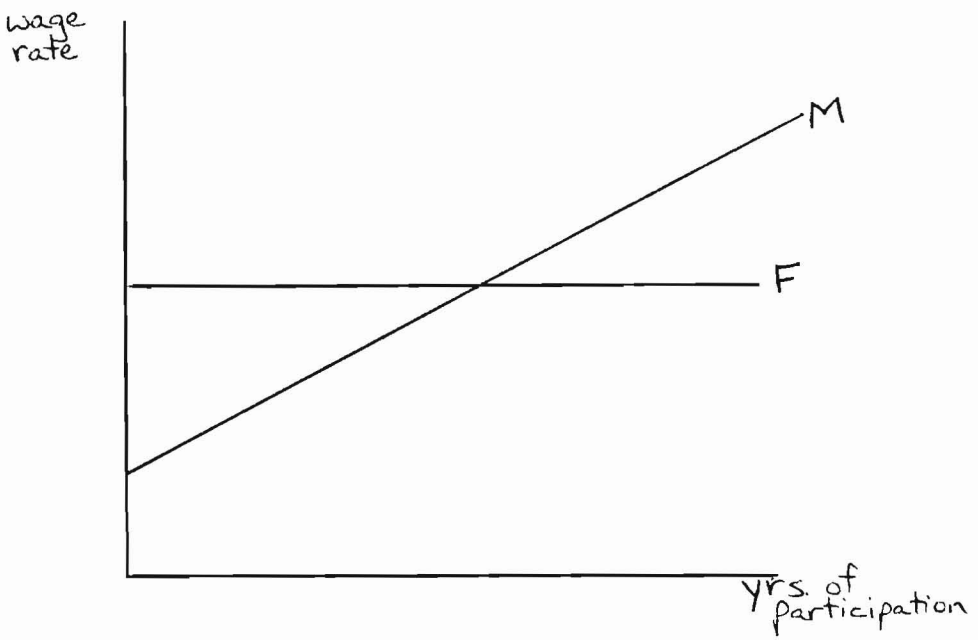
According to these sociological perspectives, even if new job opportunities opened up for women, they would reject them. Men, not women would seek the new jobs. Hence separate spheres ideology questions the notion that simply removing barriers and increasing job opportunities will lead to a decrease in segregation.

Human Capital Explanation

Human capital theory refers to the concept that since women anticipate shorter and less continuous work lives than men, it will be in their economic self interest to choose female occupations, which presumably require smaller human capital investments and have lower wage penalties for time spent out of the labor market.

Studies by Harriet and Stevenson, address the human capital theory as a possible cause of segregation. These studies focus mainly on a woman's decision to enter certain occupations. According to Zellner's 1975 study, 47 percent of employed women in

1960 were in occupations where women represented 80 percent or more of total employment; only 2 percent of employed men were in these occupations. Twenty percent of employed women were in occupations in which they represented less than 33 percent of total employment, almost 90 percent of men were in these occupations. A finer breakdown of statistics was provided also. For example, until 1960 barbers, beauticians, and manicurists were lumped together in a single category. But a further breakdown of the category into two separate ones: hairdressers and cosmetologists and barbers shows that women represented 89 percent of hairdressers and cosmetologists, but only 3 percent of barbers. (Zellner, 1975, p.125) Zellner attempts first to build and test a model for discrimination and then determine how well objective market processes can account for discrimination. The first step was to determine how people made their occupational choices. What makes a person want to be a lawyer or a professor? One of the determinants is said to be the expected financial reward associated with each job. However, the choice may not be made solely on the basis of which occupation pays more. Other factors play a key role, such as preference for a certain type of work, or time supplied to the labor force. Zellner demonstrates this best with a graph:



Suppose there are two occupations, **F** and **M**. They both require equal amounts of schooling. The wage rate of **M** increases with the years of experience, hours worked per week, and weeks worked per year in occupation **M**, while the wage rate of **F** stays the same regardless of participation levels. At a certain point wages in **F** and **M** will be the same. But as participation levels increase the wage of **M** will increase while wage in **F** does not change. The point made here is that a person who intends to supply less time to the labor market will prefer occupation **F**, while a person who intends to supply more time to the market will choose occupation **M** because he/she can increase his/her wage as time goes on. Zellner believes that women who enter the more female dominated occupations do intend to supply less time to the labor market than those who enter the more male dominated occupations. Because these women spend less time in the market, they expect a lower rate of return on their investment. This causes women to choose occupations with

less training. After all, there are no incentives for a woman to spend time and money being trained, if she will not utilize her training or be compensated for it. The hypothesis that women choose occupations requiring less training because they intend to work less in the market assumes that labor supply intentions govern occupational choice. Basically, women make different choices than men. They choose occupations that are easy to move in and out of because of their tendency to leave and enter the labor market frequently.

Some of the factors that Zellner assumed would affect the level of married women participating in the labor force are as follows: wages, husband's income, children, age, and education. According to the study, wages had a positive effect on the labor supply of women. If there was an increase in the wife's wages, that would lead to an increase in family income. Leisure would become more expensive so this would increase time spent in the labor force. Husband's income earned had a negative effect on the labor participation rates of married women. If a woman's husband made more money, the wife had little reason or incentive to find a job, unless satisfaction from working was important to her. She could stay at home and increase her domestic skills. This leads to an increase in segregation among males and females because females will develop domestic skills and the male will develop increased wages as well as increased work experience.

A significant factor in determining a female's participation rate is the number of children she has. There exists a negative

relationship between the supply of women in the labor force and children. The results are more significant the younger the children are. The negative relationship is strongly significant for a woman with a child of 1-6 years old, moderately significant for women with children 6-11 years old.

The relationship between wife's schooling and her labor supply can be misleading. Higher levels of schooling may be associated with stronger tastes for market work. Also, the opportunity cost of not working is greater for those with higher levels of educational attainment. Zellner also draws the conclusion that individuals with stronger tastes for market work would supply more time to the labor market. Women who have invested more time into training have more to lose than if they had invested little or no time in training. It is costlier for women in male dominated occupations to leave the labor force because they have so much at stake. Employers will also lose if a highly trained female must leave work for child-raising purposes, etc.

All of these factors - wages, husband's income, children, and education - are said to affect labor force participation rates in different ways. These can all be used to explain increases or decreases in labor force participation rates of women relative to labor force participation rates of men. Participation rates can be explained based on the factors (mentioned above) by Zellner. The different factors that affect labor force participation can be used to explain why segregation occurs and to what extent. Consequently, women who have labor force participation rates similar to men will

have similar occupation choices. In this case, the degree of occupational segregation will be lower when female and male participation rates are similar.

Mary Stevenson (1988) completed a study on wages and sex segregation by occupation. Stevenson borrows Bergmann's theory to argue that women workers are crowded into a limited number of occupations. Because women must compete with each other for jobs that are within the small range of occupations in which women are deemed acceptable, the supply of labor to these occupations is increased and segregation occurs. She believes, as Bergmann does, that removal of discriminatory barriers would reduce competition for jobs in female dominated occupations and increase competition for jobs in male dominated occupations. One result of discrimination is that women do similar work to that of men who have fewer years of schooling than they do. In consequence, the woman's return on investment in education is reduced, since she needs a higher education than a man to perform the same kind of work. This could lead to a disincentive for a woman to obtain an education, because the returns she receives on her education are less than that of a man.

Stevenson hypothesized that, of those performing jobs with similar human capital requirements, women are concentrated in fewer distinct occupations. She used an index of segregation to illustrate the distribution of men and women. It was used to determine what percentage of members in a particular cohort would have to change jobs in order for there to be an equal distribution

between two cohorts. The index of segregation may be measured as:

$$\frac{\sum_{i=1}^{n} |X_1 - X_2|}{2}$$

x1 = percentage of males in an occupational level
x2 = percentage of each female group in an occupational level
n = number of occupational levels (Stevenson, 1988, p.182)

The index works as follows: Suppose we have all men and women in three occupations: A, B, and C.

	women		men
A	30%	A	40%
B	45%	B	25%
C	25%	C	35%

In order for the two distributions to match, either 20% of women would have to move from B (10% to A, 10% to C) or 20% of men would have to move to B (10% from A, 10% from C). Therefore 20% of the men and women would have to change jobs and the index of segregation would be 20%. Through her use of this index of segregation, Stevenson saw a need for some changes in policy to reduce the level of occupational segregation among men and women. The main goal is that women must enter formerly male-dominated occupations and males must enter formerly female-dominated occupations. In order for this to occur, female-dominated occupations must be made more attractive to males.

If women make different human capital decisions, it is very possible that an increase in the number of male-dominated job openings will have limited effects on the level of segregation. In order for integration to occur, women must choose to move into these jobs. One must determine if the new jobs are positions women

want based on the factors of time, etc. discussed above. If these jobs are not desired by women, then the rapid growth of employment opportunities in male-dominated occupations is not relevant to women. It is my view that although human capital considerations are important, many women would not overlook opportunities to move into non-traditional occupations. Furthermore, since participation patterns of younger women are becoming more like those of men, their occupational choices should become more like their male counterparts.

Statistical Discrimination

Another barrier for women in the labor market is statistical discrimination. Statistical discrimination is consistent with profit maximization and the persistence of discrimination in the long run. This sort of discrimination occurs when employers must make hiring decisions under conditions of incomplete information or uncertainty. Employers will often use any accessible information that may be correlated with productivity or job stability in making decisions on who to hire. Basically, they make decisions based on stereotypes.

For example, men as a group are perceived to have certain strengths; approaching problems rationally, getting people to work together, understanding financial matters, leadership potential, wanting to get ahead, and standing up under fire. Women are

assumed to have a clerical aptitude, being good at detail work, enjoyment of routine tasks, being sensitive to criticism, jealous, and putting the family ahead of the job. If an employer has these incorrect or exaggerated beliefs, actions based on them are clearly unfair. These views may be correct on the average, but they should not be used to determine the expected productivity of an individual. In other words, if a male and a female with equal education and experience were competing for one open position, the employer would have to choose either the male or the female. If both candidates were equally qualified, the employer has nothing else to base his decision on besides those ideas or information he has on the productivity of men compared to women. Also, employer's ideas about female job instability may lead them to give women less specific training and assign them to small jobs. This causes women to quit and respond by exhibiting the unstable behavior that employers expect.

Another type of indirect discrimination is what is called the "glass- ceiling". This "glass ceiling" represents the idea that a woman has gone as far as she can go in a company's corporate ladder. A woman may be able to obtain a job in a company, for example, but her prospects for advancement into an executive position are limited. This is a sort of silent discrimination because it is much harder to prove that it is occurring.

Many times women may be passed over for promotions because of misconceptions about what women want. (Saltzman, p.48) In 1991, Labor Secretary Lynn Martin studied nine major companies including

PepsiCo and Sterling Drug to identify whether or not women's career paths were blocked by a" glass-ceiling". The report concludes that there is a "glass-ceiling" that limits women's opportunity to participate in overseas assignments, company-sponsored training programs, etc. Of the companies studied, men in positions of authority assumed that a woman with children would not be interested in a high-profile transfer or change of assignment because of the longer hours the job would require. According to a study conducted by the University of California at Los Angeles Graduate School of Management, today, only 3 of every 100 top executive jobs, at the largest companies, are held by women. (Saltzman, p.40)

Statistical discrimination leads one to believe that an increase in the amount of male-dominated job opportunities would have limited impact on women. Even if there were new job opportunities available to women, statistical discrimination would reduce a woman's chances of receiving the new job. Based on this, no matter how many new jobs open up, segregation will not decrease because men, not women will be receiving these new jobs.

Overt Discrimination

Overt discrimination occurs when an employer or a customer has a taste for discrimination against women, or a personal prejudice against women. Some men dislike interacting with women as equals or superiors. This prejudice will create a barrier for those women

hoping to enter certain "male dominated" occupations. Gary Becker described discrimination as a "personal prejudice" or a "taste against associating with a particular group". (Blau and Ferber, p.244) Men may be willing to work with women who are in complementary or subordinate positions, but men dislike interacting with women as equals or superiors. These discriminatory tastes may be held whether or not it is believed that women are less qualified than men for nontraditional pursuits.

Becker also made the connection between the discrimination of women in certain occupations and lower wages. Discrimination is said to decrease the size of traditionally male occupations because it makes labor artificially expensive to hire for those occupations. Consequently, female occupations have been enlarged because labor is artificially cheap in the woman's labor market. This view of Becker's clearly supports the crowding hypothesis developed by Bergmann. If an employer has tastes for discrimination against women, he or she will act as if there were a non-pecuniary cost of employing a woman. This cost can be known as the discrimination coefficient (d_r). To the employer, the cost of employing a man will be his wage, but the full costs of employing a woman will be her wage plus d_r. The woman will be hired only if she may be paid less than her productivity. (Blau and Ferber, p.245) If all women are hired by non-discriminatory firms, there would be no wage differentials. However, if tastes for discrimination are widespread, and there are many women seeking employment, some women will have to take jobs at discriminatory

firms. These women will only obtain employment if their wage is less than that of a man.

If a male employee has tastes for discrimination against women, he will act as if there are non-pecuniary costs of working with women equal to his discrimination coefficient. He must be paid a wage equal to this coefficient in order to induce him to work with women. It would not be feasible for the employer to hire the woman in a case like this, because of the extra cost associated with it. Furthermore, educational and training differences caused by tastes for discrimination against women can cause women to be less productive than men in certain occupations. Likewise, if this employer hired a woman to work with this discriminatory man, the productivity of the male worker would decrease. (Blau and Ferber, p.248)

A male may be reluctant to train a female because of his distaste for women. Other males in the office may also give the male a hard time if he has to train a female. They may make comments that suggest that he is interested in the female, which causes the male to "keep his distance". As a result of this, the woman does not get the thorough training she should get and she is at a disadvantage compared to the other workers in her office. Consequently, this causes an employer to hire men in order to keep his customers happy. This scenario prevents the employer from hiring a woman because he would like to keep his existing and trained workers happy. Additionally, customers may have prejudices against women and demand a lower fee for services and products from

a woman.

Much discrimination is a direct consequence of society and what we have been taught since we were young children. In grade school, a distinction is made between males and females. Research findings indicate that, until recent years, teachers typically interacted differently with their male and female students. (Curran, Renzetti, p.86) Boys were geared toward mathematics and science and girls were taught home economics and sewing. The teacher may assign boys and girls different classroom chores. The boys may be asked to carry books, or move desks, whereas the girls might be asked to dust or water the plants. This denies boys and girls the chance at working together, and it may make it more comfortable for these children to work in these separated groups. These children may feel uncomfortable working in mixed-sex groups - a feeling they may carry with them when they are in the labor force. However, recent years have seen a departure from this sort of "discrimination in the classroom". This assumes that more equal interaction of teachers with male and female students will eventually lead to a decrease in the number of men and women who feel uncomfortable working with each other in a job.

In addition to educational and training barriers, there are also professional barriers for women. Many times women are denied access to professional groups. At one time, women could not belong to the American Medical Association or to the Bar Association. There are certain important ramifications of not being able to be part of such organizations. A professional who is

not allowed membership into such an organization of his peers will miss out on establishing connections with his colleagues. Many times membership into various groups provides the professional with new clients and referrals. If the professional is restricted from this information, he will not have the opportunity to do as well as someone who is not restricted from such groups.

Even if all of the barriers that exist for women in the work place are dissolved, there still exists the importance of a male's occupational choices. The expansion of male-dominated jobs can be thought to decrease the amount of sex segregation in the work place when women fill these available jobs, but there is another factor that could work to decrease segregation. The entrance of males into otherwise female-dominated occupations would work to decrease the amount of unbalance. Before a male would consider entering a female-dominated occupation, he must have some incentive to do so. As described earlier, there are certain negative connotations associated with female-dominated occupations, such as: "women's work is more stressful and it offers less compensation, mobility, and prestige." (Curran and Renzetti, p.183) T a s t e s f o r discrimination against women are thought to have a negative effect on segregation. If women are not hired because of prejudices, then segregation will not decrease. Contrary to this, discrimination could have a positive effect on job opportunities for females if we consider that an employer must pay a male more for his work. This would cause employers to hire fewer males, and hire more females to avoid paying higher wages. This is consistent with the belief that

an increase in male-dominated jobs will lead to more opportunities for women and a decrease in segregation. If employers are choosing females to fill new positions in order to avoid the extra cost of hiring a discriminatory male, then segregation should decrease.

Job Opportunity Explanation

Assuming that barriers to women entering male-dominated occupations can be, and are removed, another factor must be considered. That is, new positions must be opening up in male-dominated occupations in order for women to take advantage of the reduction of the barriers described above and integrate male-dominated occupations. If there are no traditionally male jobs available, then there are no opportunities for women to move out of the female-dominated jobs and into the male-dominated jobs.

A look at specific occupational growth projections through the year 2005 will tell us if there will be an increase or a decrease in male dominated jobs and to what extent there is an increase or a decrease.

V. RESEARCH DESIGN

The empirical contribution of this study relies on data from the Bureau of Labor Statistics. The Bureau provides data concerning the number of females and males working in various

occupations for the year 1990 as well as projected occupational participation of each group in 2005. The focus of this study is to determine which male-dominated occupations and which female-dominated occupations are growing and to what extent. Only those occupations that were male or female dominated were considered, and the other occupations were discarded.

The number of men and women employed in various occupations in the years 1990 and predicted for 2005 formed the core of data. Occupations were broken down by specific titles and the total number of women employed in each occupation, and the total number of men and women in 1990 was given. Then, the percentage of women in each occupation was determined. From these figures, the percentage of females in an occupation, and the percentage of males per occupation was determined. Occupations were ranked according to the percentage of females in the occupation and the occupations were then divided into three categories: female-dominated occupations, gender neutral occupations, and male-dominated occupations. The way that these categories were derived is based on the percentage of females in each occupation. First, we found that in 1990 women made up 45.4 percent of the total work force. An occupation which contains this percentage of women would be considered perfectly integrated because female representation in it would be the same as their representation in the entire employed work force. To focus on trends in segregated occupations it is necessary to create boundaries that separate segregated occupations from those which are not. Gender neutral occupations were

arbitrarily defined as those occupations which were 45.4 percent female plus or minus 10 percentage points (i.e., occupations with 35.4 percent to 55.4 percent female). An occupation was said to be male-dominated if the percentage of women employed in the occupation in year 1990 was below 35.4 percent If the occupation contained 55.5% or more women, the occupation was considered a female-dominated occupation. For example, (See Appendix for a listing of each occupation and the percent female contained in each) the occupation of a physician was considered a male-dominated occupation because the percentage of women employed as physicians in 1990 was 19.3 percent. This 19.3 percent falls in the 35.4 percent boundary assigned to an occupation that is considered male-dominated. After adjusting the data to include only those gender dominated occupations, 177 different occupations were included in the table. The major focus of the study is to determine whether or not jobs in male-dominated fields are opening up and thus creating opportunities for women to move out of the female-dominated jobs and into the male-dominated jobs. After identifying those jobs that are female and male-dominated via the 1990 figures, the next step was to determine which occupations were growing or shrinking. Total numbers employed in each occupation were provided by the Bureau of Labor Statistics also. These numbers were available for 1990 and a special edition of the Monthly Labor Review (Silvestri Lukasiewicz) provided a future projection of the total number employed in these occupations in 2005. A percentage change in the number employed in each occupation was calculated to

determine the extent of growth or decline in each occupation. (The percentage change per occupation is included in Appendix). The percentage change was calculated by the formula:

(YR5-YR90/YR90)*100

For example, the occupation of Registered Nurses contained 1,727 (in thousands) people in 1990, and is projected to employ 2,494 in 2005. The percentage change was +44.41 percent, calculated by: (2,494-1,727/1,727)*100. In other words, the occupation of Registered Nurses **increased** by 44.41 percent.

The percentage change in employment in all male-dominated occupations was also calculated. This was done by computing the percentage change in the total number employed in all male-dominated occupations between 1990 and 2005. The same was done for female-dominated occupations.

The significance of a female occupation increasing is not as important as an increase in an occupation that is considered to be male-dominated. The theory of the paper states that increases in male-dominated occupations, not female-dominated occupations, create opportunities for segregation to decrease.

VI. RESULTS

Male-dominated occupations are projected to grow faster than the female-dominated occupations. Employment in male-dominated occupations is projected to change by +21.21 percent, compared with

a +17.41 percent change in female-dominated occupations. These numbers support favorable conditions for integration of male-dominated occupations in the future.

We can see that there is a downward trend in the amount of sex segregation in the work place when we look at Figures 1-4 (in Section 2). These graphs show the increase in female participation in some formerly male dominated occupations. Although the percentage of women in the engineering profession, for example (Figure 2) was very small in 1990, the expected participation of women in this field is expected to grow by 2005. (Bureau of Labor Statistics, 1991)

The fact that male-dominated jobs are expected to grow more in the future has certain implications for women. An increase in the number of jobs available makes it easier for women to move into a male-dominated job. It is not reasonable to assume that a woman would be hired to replace a male due to all of the tastes for discrimination and ideas about women as a group that have been discussed earlier in this paper. Instead, there must be new jobs created for women to move into. The growth in these male-dominated occupations is encouraging, but another important stipulation of the integration theory developed in this paper is that the barriers must be removed to allow women access to these occupations.

VII. CONCLUSION

As time has passed, people's attitudes have changed about the differences between men and women. The women's movement has been going on for decades and women have made gains as time has passed. One important catalyst for the equality of women was a book by Betty Friedan published in 1963, The Feminine Mystique. Friedan discussed housewives who felt that they were stuck in homes that were described as "comfortable concentration camps". (Curran, Renzetti, p.333) This publication served as a starting point in developing the analyses of sexual politics, or the examination of gender inequality. This emergence and interest in equality leads people to a better understanding of the problems that are associated when one group is not considered equal to another group by society. Once people understand these problems, they can work at changes and proposing new policies. New generations have grown up in a world where women can do just about anything men can do. If this is the case, then the occupations from which men and women choose should be the same.

Not only does occupational segregation result in social inequalities among gender, it results in economic inequality also. Many of the jobs women are highly concentrated in are undesirable, monotonous, and/or stagnant. There is no room for mobility or benefits. Too many women are discouraged from entering certain male-dominated occupations simply because they feel intimidated by

being the only females. Also, many women are discriminated against when looking for male-dominated jobs. This works in reverse too. Many men hesitate to enter female dominated occupations for these same reasons. There are many different groups that are fighting for new reforms and legislation on issues they feel are important to society. Unfortunately, each of these groups believes that their ideas are the most important ones, and they should be given priority over others. However, in a society with so many problems occurring at once, reforms need to be enacted that work together to combat **all** of these problems. With so many different groups fighting with each other, a meeting of the minds is highly unlikely.

VIII. POLICY PROPOSALS

There are many barriers to women entering male dominated jobs, most of which have to do with discrimination. In many cases, if a woman gets hired for a job, her prospects for advancement are limited. An article in the March 28, 1992 edition of "The Economist" suggests that the process should not stop at the hiring stage. Companies need to nurture their employees and provide them with equal chances for success. Few women get far in business, which is consistent with the "glass-ceiling" theory discussed earlier. "That is not just their (the woman's) loss, but their employers'. Hire women managers, promote them, create the right

conditions to keep them, and companies will see the results." ("Women in Management, p.20)

Legislation must be passed and enforced to combat incidences of discrimination. Affirmative action and the Equal Employment Opportunity Commission are two examples of such legislation.

Another possible solution or improvement to the problem of sex segregation is to make women a more marketable commodity in a male dominated labor force. The creation of seminars for women to teach them how to be more aggressive and competitive might be helpful. Also, females could be directed at a young age into courses and activities that are valued more highly in the labor market.

Women have definitely made gains in the labor market over the years, but it is also obvious that there are many more gains to be made before men and women can be considered truly equal in the workforce. As this study indicates, segregation has decreased over time, and the prospects for the future look promising. The increase in opportunities for women to enter growing male-dominated occupations is a step forward, but employers need to foster the development of the female employee by eliminating those barriers which exist for women in the work place.

BIBLIOGRAPHY

-Amsden, Alice H. The Economics of Women and Work. New York: St. Martin's Press, 1980.

-Bergmann, Barbara R. The Economic Emergence of Women. New York: Basic Books, Inc., 1986.

-Blau, Francine D., and Marianne A. Ferber. The Economics of Women, Men, and Work. New Jersey: Prentice-Hall, 1986.

-Curran, Daniel J. and Renzetti, Claire, M. "Restructuring Sex/Gender Systems," Pp.325-351, Women, Men and Society: The Sociology of Gender. Needham Heights, MA: Allyn and Bacon Press, 1989.

-Curran, Daniel J. and Renzetti, Claire M. "Restructuring Sex/Gender Systems," Pp.172-206, Women, Men and Society: The Sociology of Gender. Needham Heights, MA: Allyn and Bacon Press, 1989.

-Curran, Daniel J. and Renzetti, Claire M. "Schools and Gender," Pp.80-105, Women, Men and Society: The Sociology of Gender. Needham Heights, MA: Allyn and Bacon Press, 1989.

-The Economist. "Women in Management." The Economist. Mar. 28, 1992: p. 17-20.

-Fuchs, Victor R. Women's Quest for Economic Equality. Cambridge, MA.: Harvard University Press, 1988.

-Fullerton, Howard N. "Labor Force Projections: 1986-2000". Monthly Labor Review Sept. 1987: 19-29.

-Koziara, Karen S., Michael H. Moskow, and Lucretia D. Tanner. Working Women: Past, Present, Future. Washington, D.C.: Industrial Relations Research Association, 1987.

-Kutscher, Ronald E. "New BLS Projections: Findings and Implications." Monthly Labor Review Nov. 1991: 3-12.

-Lukasiewicz,John, and Silvestri, George. "Occupational Employment Projections". Monthly Labor Review Nov. 1991: 64-94.

-Matthaei, Julie A. An Economic History of Women in America: Women's Work, the Sexual Division of Labor, and the Development of Capitalism. New York: The Harvester Press, 1982.

-National Opinion Research Center. "The Social Prestige Associated with Various Occupations." General Social Surveys: Cumulative Codebook. 1983.

-Reskin, Barbara E, and Patricia A. Roos. Job Queues, Gender Queues: Explaining Women's Inroads Into Male Occupations. Philadelphia, PA: Temple University Press, 1990.

-Richardson, Laurel. "The Work World: Organization and Process," Pp.172-190, The Dynamics of Sex and Gender: A Sociological Perspective. New York, New York: Harper and Row Publishers, Inc., 1988.

-Richardson, Laurel. "The Work World: Organization and Process," Pp.227-250, Social Movements. New York, New York: Harper and Row Publishers, Inc., 1988.

-Saltzman, Amy. "Trouble at the Top." Business Week June. 1991: 38-48.

-Shank, Susan E. "Women and the Labor Market: The Link Grows Stronger". Monthly Labor Review Mar. 1988: 3-8.

-Stevenson, Mary H. "Relative Wages and Sex Segregation By Occupation," Pp.175-200 in Cynthia B. Lloyd (ed), Sex, Discrimination, and the Division of Labor. New York, New York: Columbia University Press, 1975.

-U.S. Department of Labor. Labor Force Statistics Derived From the Current Population Survey, 1948-87. Washington, D.C.: U.S.Government Printing Office. August, 1988.

-Wachtel, Howard M. Labor and the Economy. USA: Harcourt Brace Jovanovich, Inc., 1988.

-Zellner, Harriet "The Determinants of Occupational Segregation," Pp.125-145 in Cynthia B. Lloyd (ed), Sex, Discrimination, and the Division of Labor. New York, New York: Columbia University Press, 1975.

Projected Occupational Data for the Year 2005

APPENDIX

	EMP90	PROJ05	% WOMEN	% CHANGE
Purchasing Managers	248	298	31.9	20.16
Managers, MKG,ADV,PR	427	630	31.1	47.54
Management Analysts	151	230	34	52.32
Construction Inspectors	60	71	5.1	18.33
Compliance officers	156	202	26.9	29.49
Architects	108	134	18.4	24.07
Aerospace Engineers	73	88	7.3	20.55
Chemical Engineers	48	54	10.9	12.50
Civil Engineers	198	257	5	29.80
Electrical Engineers	426	571	8.7	34.04
Industrial Engineers	135	160	11.9	18.52
Mechanical Engineers	233	289	5.4	24.03
Computer Scientists	463	829	34.5	79.05
Chemists/not Biochemists	83	96	27	15.66
Geologists	48	58	14.3	20.83
Physicians	580	776	19.3	33.79
Dentists	174	196	9.5	12.64
Clergy	209	228	9.6	9.09
Lawyers	587	793	20.6	35.09
Musicians and Composers	252	276	31.9	9.52
Photographers	107	131	27.8	22.43
Announcers	57	68	18.5	19.30
Athletes	32	43	26.4	34.38
Electrical Technicians	363	488	15.4	34.44
Drafting Occupations	326	370	18.9	13.50
Science Technicians	246	305	31.9	23.98
Pilots and Navigators	122	154	5.1	26.23
Insurance Sales	439	527	32.7	20.05
Securities Sales	191	267	23.4	39.79
Mail Carriers	305	380	24.9	24.59
Messengers	143	160	28.2	11.89
Traffic Ship/Rec clerks	762	860	26.8	12.86
Meter readers	50	37	15.2	-26.00
Supervisors, police Det.	93	113	8.6	21.51
Firefighters	280	348	1.2	24.29
Police, public service	453	578	12.1	27.59
Sheriffs, Bailiffs	109	124	12.8	13.76
Correctional Inst. Officers	230	372	17.7	61.74
Guards	883	1181	20.5	33.75
Barbers	77	76	18.7	-1.30
Automobile Mechanics	757	923	0.8	21.93
Bus, Truck Mechanics	268	326	0.4	21.64
Aircraft Mechanics	122	152	2.8	24.59
Small engine repairers	89	97	0.2	8.99
Auto body repairers	219	267	0.7	21.92
Heavy equipment mechanics	104	117	0.7	12.50
Industrial Machinery repaire	474	520	3	9.70
Electronic repairer	200	165	7.4	-17.50
Data Processing equip. repai	84	134	11.4	59.52
Telephone Line Installers	133	92	6.9	-30.83
Telephone repairers	47	21	11.3	-55.32

Projected Occupational Data for the Year 2005

	EMP90	PROJ05	% WOMEN	% CHANGE
Heating/Air Cond. Mechanics	219	266	0.5	21.46
Office machine repairers	73	82	5.4	12.33
Millwrights	73	82	2.8	12.33
Brick and Stonemasons	152	183	0.2	20.39
Tile setters	28	35	2	25.00
Carpet installers	73	84	2.1	15.07
Carpenters	1057	1209	1.3	14.38
Drywall installers	113	128	1	13.27
Electricians	548	706	1.7	28.83
Electrical power installers	99	108	1.7	9.09
Painters, Construction	453	564	5.6	24.50
Plumbers, pipefitters	379	459	0.9	21.11
Concrete finishers	113	128	0.6	13.27
Insulation Workers	70	87	1.5	24.29
Roofers	138	169	0.3	22.46
Structural metal workers	80	95	0.2	18.75
Extractive occupations	237	247	1.9	4.22
Tool and die makers	141	145	1.6	2.84
Machinists	386	427	3.9	10.62
Sheet-metal workers	233	263	6	12.88
Cabinet makers	107	122	3.9	14.02
Butchers and Meat Cutters	234	220	22.1	-5.98
Water/sewage plant operators	78	101	2.2	29.49
Stationary engineers	35	36	3.6	2.86
Lathe machine operators	80	61	8.5	-23.75
Punching press operators	52	42	29.2	-19.23
Grinding machine operators	80	61	17.2	-23.75
Molding machine operators	181	204	29.5	12.71
Sawing machine operators	72	80	12.6	11.11
Printing machine operators	224	268	14.4	19.64
Separating machine operators	26	21	10.6	-19.23
Painting machine operators	160	158	13.1	-1.25
Furnace/kiln operators	56	53	5	-5.36
Crushing machine operators	135	145	31.3	7.41
Slicing/cut machine operator	88	89	24.9	1.14
Welders	332	344	4	3.61
Truck drivers	2362	2979	2.1	26.12
Drivers-sales workers	339	381	9.3	12.39
Taxi-cab drivers,chauffers	108	140	9.5	29.63
Rail transportation jobs	107	102	3.6	-4.67
Operating Engineers	157	201	0.8	28.03
Crane and tower operators	51	54	1	5.88
Excavating operators	74	83	0.6	12.16
Grader,dozer operators	93	104	1.4	11.83
Truck/tractor operator	431	469	5.7	8.82
Farmers	1074	850	15.5	-20.86
Farm Managers	149	173	17.6	16.11
Farm Workers	837	745	21	-10.99
Supervisors	65	72	7.1	10.77
Groundskeepers/Gardners	874	1222	5.7	39.82
Timber cutting/logging	108	106	1.7	-1.85

	EMP90	PROJ90	% WOMEN	% CHANGE
Fishers/hunters/trappers	61	69	4.7	13.11
Handlers/equipment cleaners	4268	4588	14.7	7.50
Underwriters	105	130	67.6	23.81
Personnel, training	278	366	60.8	31.65
Registered nurses	1727	2494	94.5	44.41
Dieticians	45	56	95	24.44
Inhalation therapists	60	91	60.1	51.67
Physical therapists	88	155	75	76.14
Speech therapists	68	91	88.1	33.82
Pre/Kindergarten teachers	425	598	98.4	40.71
Elementary school teachers	1362	1675	85.2	22.98
Special Education teachers	332	467	84.8	40.66
Counselors	144	192	61.9	33.33
Librarian	149	165	83.3	10.74
Psychologists	125	204	58.4	63.20
Social Workers	438	588	68.2	34.25
Recreational workers	194	241	70.9	24.23
Public relations specialists	109	130	58.7	19.27
Clinical lab technician	258	321	76.3	24.42
Dental hygenist	97	137	99.1	41.24
Medical records technician	52	80	94	53.85
Radiologic technician	149	252	76.4	69.13
Licensed practical nurse	644	913	96.3	41.77
Legal assistant	220	329	78.8	49.55
Sales counter clerk	215	289	69.4	34.42
Cashier	2633	3094	81.4	17.51
Computer operator	320	361	65.7	12.81
Secretary	3576	3813	99	6.63
Typist	972	869	95.5	-10.60
Interviewer	144	200	81.2	38.89
Hotel Clerk	118	158	70.6	33.90
Ticket reservation agent	150	202	60.2	34.67
Receptionist	900	1322	97	46.89
Order clerk	291	300	77.9	3.09
Personnel clerk/not payroll	129	155	88.6	20.16
Library clerk	117	130	76.2	11.11
File clerk	271	300	83.8	10.70
Record clerk	141	160	81.4	13.48
Bookkeepers/accounting clerk	2276	2143	92.2	-5.84
Payroll and timekeeping cler	171	176	91	2.92
Office machine operator	169	191	62.4	13.02
Telephone operator	325	221	89	-32.00
Expediters	237	239	66.7	0.84
Insurance investigators	423	521	72.2	23.17
Adjusters/not insurance	358	437	76.6	22.07
Eligibility welfare clerks	93	111	90.1	19.35
Bill and account collectors	183	244	67.5	33.33
General office clerks	2737	3407	81.8	24.48
Bank tellers	517	492	90.4	-4.84
Data entry keyers	475	533	87.2	12.21

Projected Occupational Data for the Year 2005

	EMP90	PROJ05	% WOMEN	% CHANGE
Statistical clerks	85	54	72.3	-36.47
Teacher's aides	808	1086	94.5	34.41
Child care workers,private	314	190	97.9	-39.49
Cleaners and servants	411	310	95.5	-24.57
Dental assistants	176	236	98.7	34.09
Health aides/not nursing	391	733	84.8	87.47
Orderlies, attendants	1274	1826	90.8	43.33
Hairdressers	636	793	89.8	24.69
Public trans. attendants	101	159	83.2	57.43
Child care workers	725	1078	97	48.69
Optical goods workers	19	25	57.5	31.58
Electrical equip. assemblers	252	155	66.7	-38.49
Typesetters/compositors	26	32	68	23.08
Textile machine operators	199	138	72.6	-30.65
Sewing machine operators	716	607	89.1	-15.22
Pressing machine operators	84	96	69	14.29
Laundering/dry cleaning	173	212	66.5	22.54
Packaging machine operators	324	297	60.5	-8.33
Hand packers/packagers	667	744	62	11.54
Animal caretakers/not farm	106	145	63.8	36.79
Retail sales workers	3619	4506	57.6	24.51
Billing/cast and rate clerks	318	332	88.7	4.40
Food preparation/service job	7705	10031	59.5	30.19
Apparel machine operators	272	302	60.8	11.03